Weekly report Alkor Cruise AL544

Goal of the cruise is to investigate biological oceanography of the Baltic Sea along the extended salinity gradient from intermediate saline SW Baltic Sea towards low saline northern Gotland Basin of the Baltic Sea. Apart from teaching a diverse set of biological oceanographic sampling techniques, the aim is to characterize the macro-zooplankton and ichthyo-plankton community. We observed large accumulations of native and invasive macrozooplankton species in different areas of the Baltic Sea as well as extended anoxia in bottom waters, especially in NE waters. Due to unstable weather conditions, we had to modify the cruise plan along the way. In short, we cancelled northern most investigation area and eastern waters to avoid being trapped by an approaching low pressure. Instead we included an in depth investigation of the SW Baltic Sea, where the invasive comb jelly *Mnemiopsis leidyi* is currently forming local blooms with very high abundance patches. We did not observe *M. leidyi* at stations north of the Bornholm Basin. In summary, we managed to sample large parts of the salinity gradient with very interesting results, especially concerning anoxic conditions in bottom waters and added a high resolution investigation of the SW Baltic Sea in order to understand population dynamics of the invasive comb jelly *Mnemiopsis leidyi*.

Note: Due to the current Corona Pandemie, the scientific staff had been reduced by 50% which makes 24h work impossible.

Daily activities are outlined below and include operation the different gear, both from a practical and theoretical perspective, analyzing all samples alife for mactozooplankton and ichthyoplankton as well as basic principals in sample handling and preservation. All data are entered by the students in the evenings and the practical work is followed up by lectures and student presentations.

Due to heavy weather conditions, the investigation area changed slightly and includes now a station grid in the SW Baltic Sea (see Fig. 1).

1.9.2020 Tuesday

8:00 Boarding of students after negative corona test and departure to Kiel Bight for station work.

Station SW4: 9:30 Start with work program at SW4

- CTD (small with fast oxygen sensor)
- Calibration of pressure unit
- Plankton net cast: Bongo

Station KB03

- Plankton net cast: Bongo
- CTD (small with fast oxygen sensor)

Station KB12

- CTD (small with fast oxygen sensor)
- Plankton net cast: Bongo

Station SW14

- Plankton net cast: Bongo
- CTD (small with fast oxygen sensor)

Station work in SW Baltic finished and cruising towards Arkona Basin

Wednesday 2.9.2020

station work started at 6:00 in the Arkona Basin

Station **BY1**

- CTD
- Bongo

Station **H18**

- Bongo
- CTD

Station **BY2**

- CTD
- Wasserschöpfer
- Bongo

Station **H14**

- Bongo
- Water rousette collecter
- CTD

Thursday 3.9.2020

Due to heavy weather, over.night stay off SW Bornholm and continuation towards northern Gotland Basin at 6:00 – first station off south western Øland at 14:00

During the moring 8:00-13:00 was used to deepen the understanding about the physical and biological oceanography of the Baltic Sea with lectures and student presentations.

Station **T8**

- CTD
- Multinetz midi (towed)

Station **T7**

- Multinetz midi (towed)
- CTD

Station **T6**

- CTD
- Multinetz midi (towed)

After station work continuation to HELCOM monitoring station BY32, north east of Gotland.

Friday 4.9.2020 station work started at 6:00 on

Station **BY32** (205m bottom depth)

- Multinet **Maxi** (towed) – to 190m
- Water rousette collecter – up to bottom
- CTD small with fast oxygen sensor (only up to 100m)

Station **T4**

- CTD (small) with fast oxygen sensor
- Multinet **midi** (towed)

Station **T5**

- CTD (small) with fast oxygen sensor
- Multinetz **maxi** (towed)

Due to bad weather and worsening of the situation, northern Stations were skipped, eastern Gotland stations as well and instead SW Baltic Sea targeted as intensive working area. The successful transect along the Swedish coast was extremely timely due to large anoxic events in bottom waters in the extended investigation area. Steeming after successful conduction of Station T5 to SW Arkona Basin, arrival around noon on.

Afternoon and evening was used to conduct Chl a extractions/measurements. The students also got familiar with oxygen measurements and winkler titration for CTD calibrations.

Saturday 5.9.2020 with station work at

Station SW10
- CTD
- WP2
- Multinetz midi (towed)

Station SW9
- Multinetz midi (towed)
- CTD
- WP2

Station SW8

- WP2
- CTD
- Multinetz midi (towed)

Sunday 6.9.2020 with station work at Stations within the SW Baltic Sea as outlined on Fig. 1

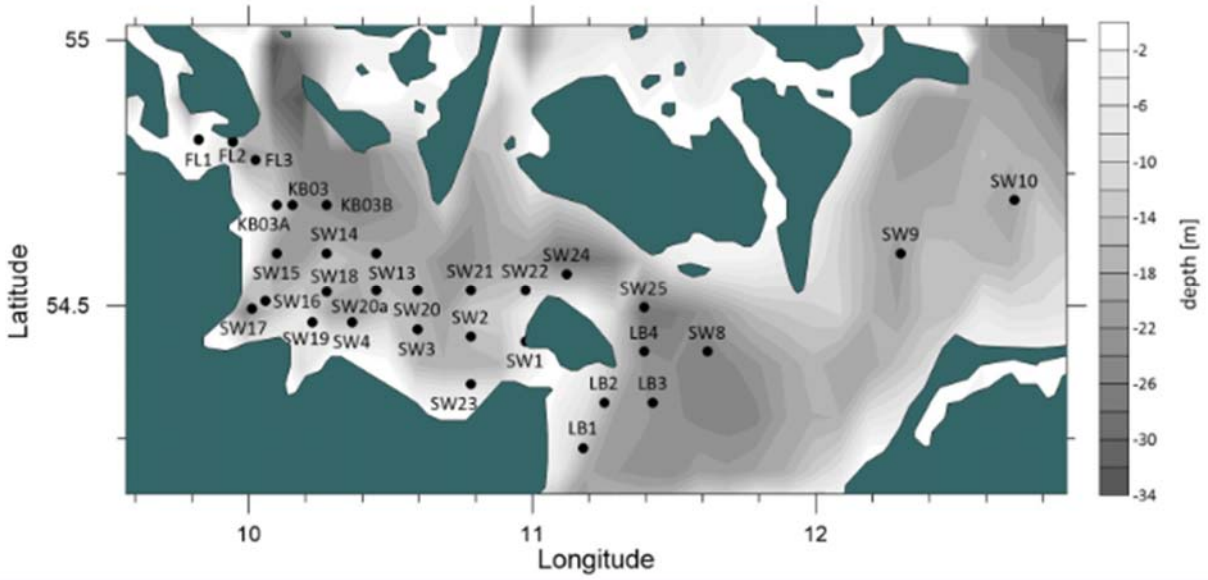

Fig. 1 Stations in the SW Baltic Sea which were added due to heavy weather conditions in the central and northern Baltic Sea.

Station LB1

- Multinetz midi (towed)
- CTD
- WP2

Station LB3

- Multinetz midi (towed)
- WP2
- CTD

Station LB2

- Multinetz midi (towed)
- CTD
- WP2

Station LB4

- Multinetz midi (towed)
- WP2
- CTD

Station SW25
- Multinetz midi (towed)
- CTD
- WP2

Station SW 24
- Multinetz midi (towed)
- WP2
- CTD

Lectures in the evening along with student presentations.

Monday 7.9.2020 with station work at

Station SW23
- Multinetz midi (towed)
- CTD
- WP2

Station SW1
- Multinetz midi (towed)
- WP2
- CTD

Station SW2
- Multinetz midi (towed)
- CTD
- WP2

Station SW22
- Multinetz midi (towed)
- WP2
- CTD

Station SW21
- Multinetz midi (towed)
- CTD
- WP2

Station SW 3
- Multinetz midi (towed)
- WP2
- CTD

Station SW20
- Multinetz midi (towed)
- CTD
- WP2

Tuesday 8.9.2020 with station work Flensburg Fjord

Station FL1
- Multinetz midi (towed)
- WP2
- CTD

Station FL2
- Multinetz midi (towed)
- CTD
- WP2

Station FL3
- Multinetz midi (towed)
- WP2
- CTD

Station KB03A
- Multinetz midi (towed)
- CTD
- WP2

Station KB03
- Multinetz midi (towed)
- WP2
- CTD

Station KB03B
- Multinetz midi (towed)
- CTD
- WP2

Station KB06
- Multinetz midi (towed)
- WP2
- CTD

Station SW13
- Multinetz midi (towed)
- CTD
- WP2

Station SW14
- Multinetz midi (towed)
- WP2
- CTD